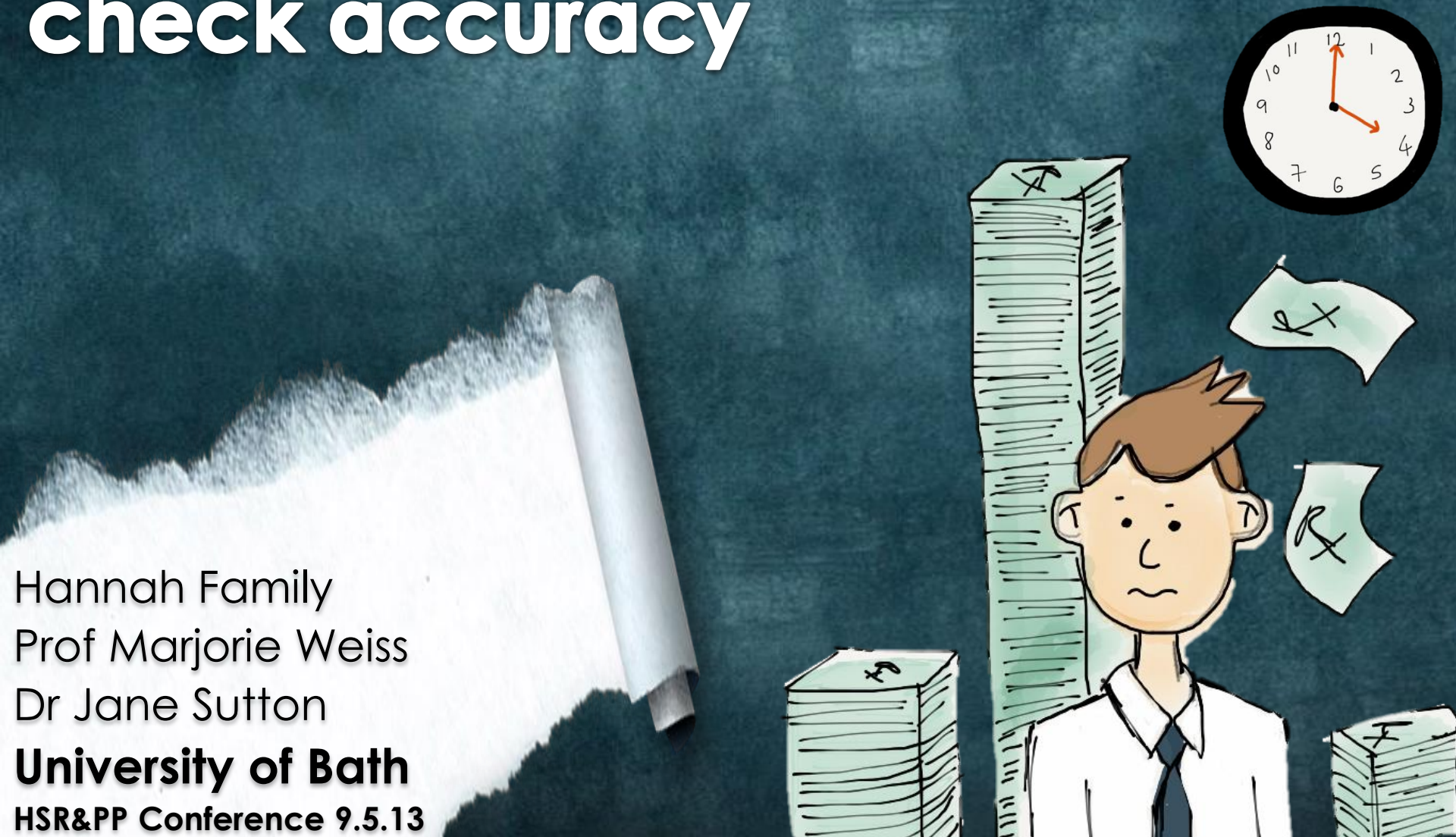
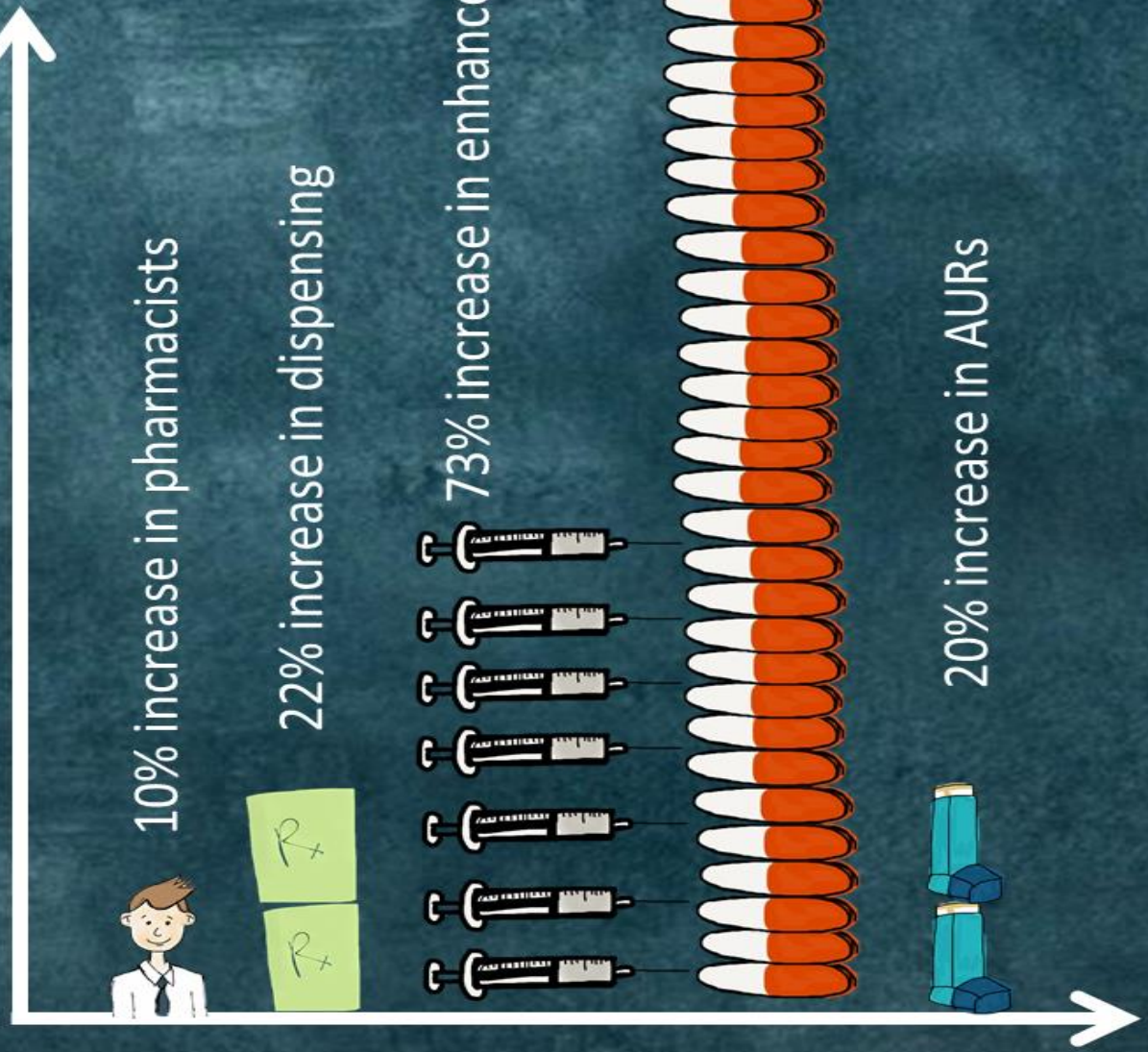
Perceived time pressure and its effect on final dispensing check accuracy



Hannah Family
Prof Marjorie Weiss
Dr Jane Sutton
University of Bath

HSR&PP Conference 9.5.13

Community pharmacy workload changes since 2005/6



Hassell & Eden (2006)

Seston & Hassell (2011)

General Pharmaceutical Services Report (2012)

Studies into the impact of community pharmacy workload

Research has found that since the 2005 contractual frameworks:

- Job satisfaction decreased

  (Bond et al., 2008, Gidman et al., 2007, Gidman, 2011)

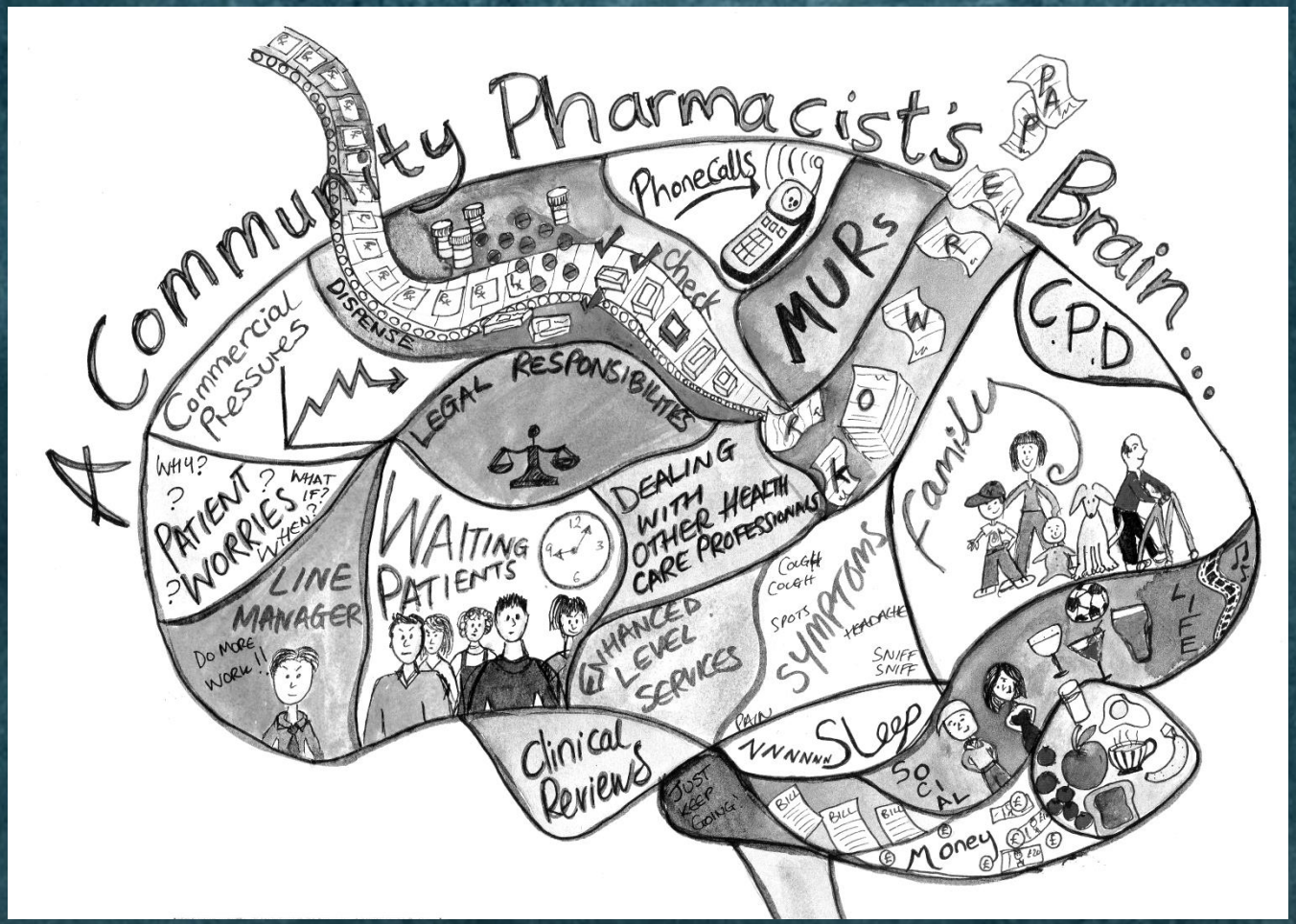
- Job related-stress increased

  (Bond et al., 2008, Gidman et al., 2007, Gidman, 2011)

- Intentions to leave the profession increased

  (Eden et al., 2009)

Workload is more than the volume of work you do…



Our study into Pharmacists' Mental Workload

(aka my PhD)

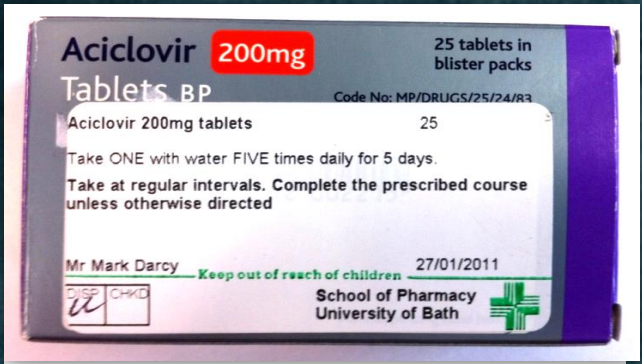
Pilot study
(n=25 pharmacists & pharmacy students)

Student pharmacist study
- 2 x simulated pharmacy experiments (n_1=52, n_2=41)
- Qualitative interviews (n=15)

novice to expert

Community pharmacist study
- 2 x simulated pharmacy experiments (n=52 per experiment)
- Qualitative interviews (n=15)
- Mental workload diaries (n=40)

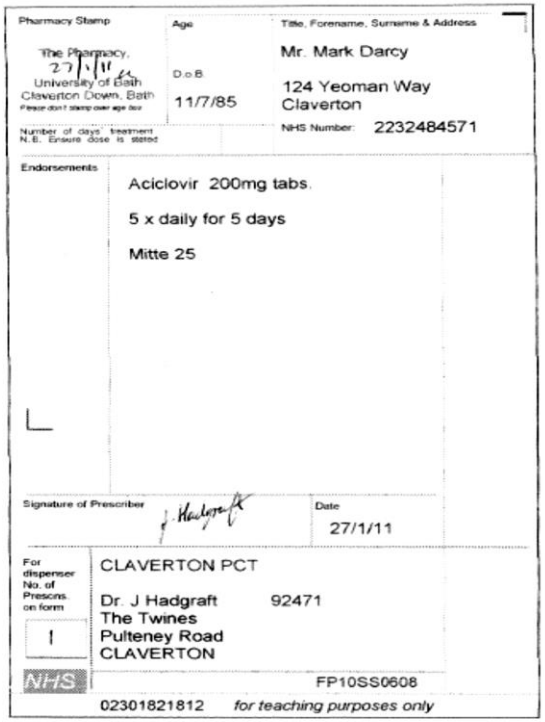
The accuracy checking task



2 x 25 dispensed items – 25 minutes

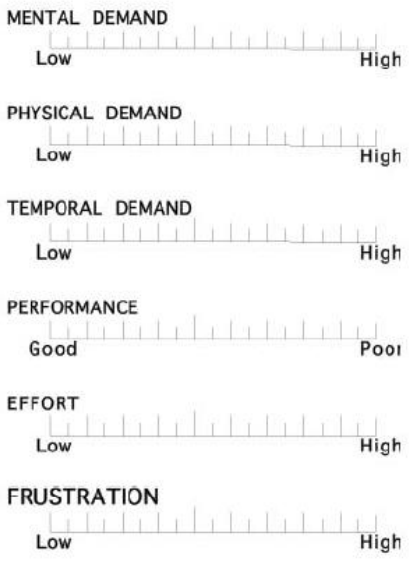
Self-completed questionnaire X 3

Big five personality inventory
Dundee Stress State Questionnaire
NASA-Task Load Index



RATING SCALE DEFINITIONS

Title	Endpoints	Descriptions
MENTAL DEMAND	*Low/High*	How much mental and perceptual activity was required (e.g., thinking, deciding, calculating, remembering, looking, searching, etc.)? Was the task easy or demanding, simple or complex, exacting or forgiving?
PHYSICAL DEMAND	*Low/High*	How much physical activity was required (e.g., pushing, pulling, turning, controlling, activating, etc.)? Was the task easy or demanding, slow or brisk, slack or strenuous, restful or laborious?
TEMPORAL DEMAND	*Low/High*	How much time pressure did you feel due to the rate or pace at which the tasks or task elements occurred? Was the pace slow and leisurely or rapid and frantic?
EFFORT	*Low/High*	How hard did you have to work (mentally and physically) to accomplish your level of performance?
PERFORMANCE	*Good/Poor*	How successful do you think you were in accomplishing the goals of the task set by the experimenter (or yourself)? How satisfied were you with your performance in accomplishing these goals?
FRUSTRATION LEVEL	*Low/High*	How insecure, discouraged, irritated, stressed and annoyed versus secure, gratified, content, relaxed and complacent did you feel during the task?



Results

	Pilot study (n=15)	Experiment 1 (n=52)	Experiment 2 (n=20)
Temporal demand task 1 (s.d)	4.19 (2.74)	7.40 (2.14)	6.86 (2.06)
Temporal demand task 2 (s.d)	5.13 (2.72)	6.48 (2.44)	6.52 (2.58)

No time limit

No timer

Results

(experiment 1 only)

Temporal demand scores were negatively correlated with hit rates (detection of dispensing errors) r=-.28 (p<.05)

Students reports of temporal demand	Miss rate	
High (>7.25) N=26	32.73%	($t(50)=2.68$, $p<.01$, $r=.35$)
Low (<7.25) N=26	19.82%	

Was there anything unique about the participants who felt more time pressure?

No significant difference was found in:

- Time taken to check the items
- Community pharmacy, or other pharmacy experience

		Mean	Std. Deviation	Std. Error Mean
Number of weeks of community pharmacy work experience	Low temporal demand	26.94	32.81	6.44
	high temporal demand	26.65	45.00	8.83
Total number of weeks of work experience in pharmacies (all types)	Low temporal demand	32.00	32.32	6.34
	high temporal demand	29.04	45.11	8.85
Time taken (in minutes) to check the 50 dispensed items in task 1 and 2	Low temporal demand	49.25	2.41	.47
	high temporal demand	52.19	8.67	1.70

Was there anything unique about the participants who felt more time pressure?

A significant difference was found in:

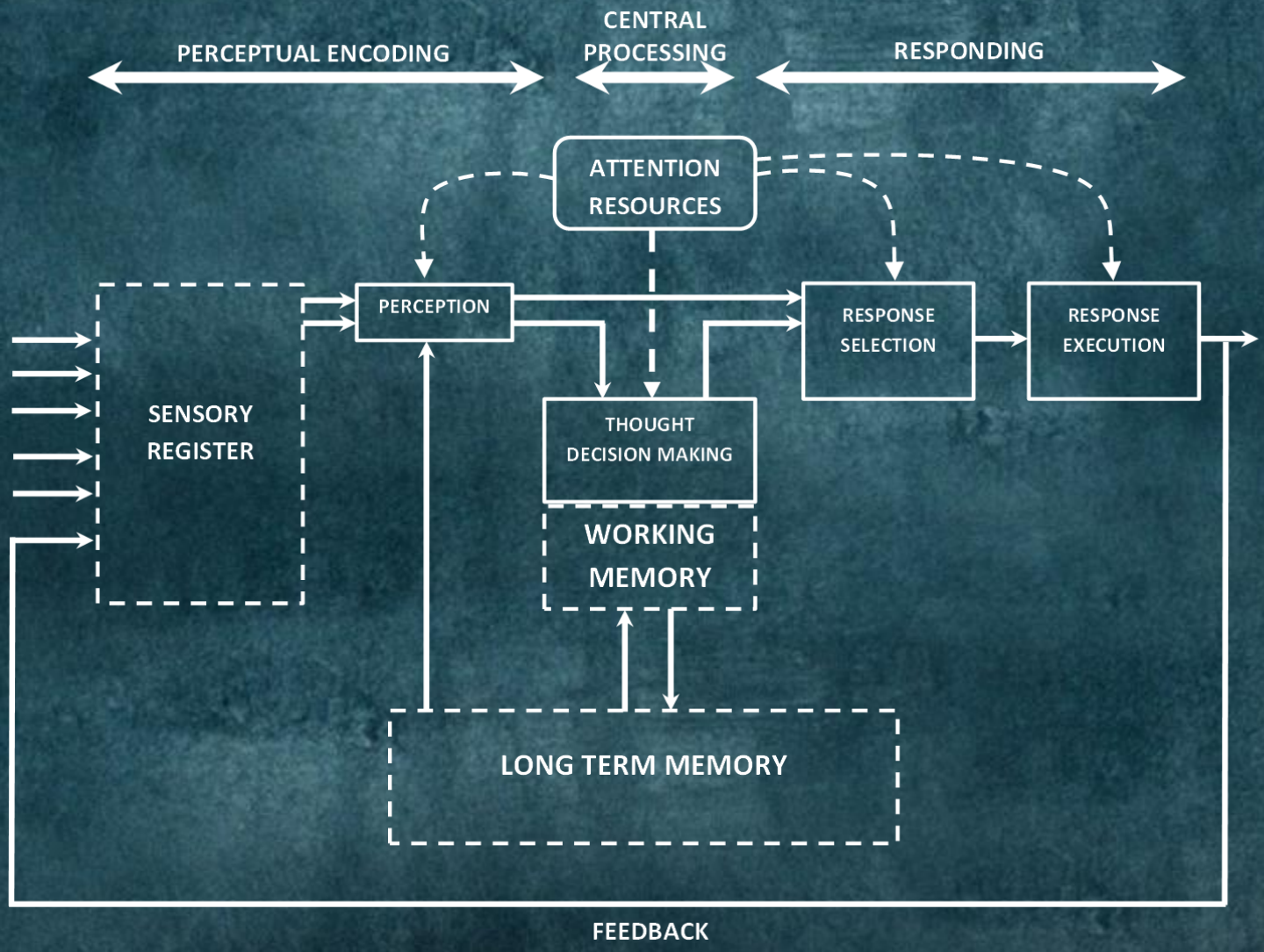
- Mental effort scores for task 1
- Mental demand for task 2
- Frustration for task 1 and task 2
- Overall MW for Task 1 and Task 2

- Extraversion Personality trait

- Task Related Interference task 2

		Mean (SD)	T-test
The effort needed to do the task (Task 1)	Low	6.77 (1.24)	($t(50)=-1.67$, $p<.05$, $r=.23$)
	high	7.62 (1.33)	
The frustration you experienced during the task (Task 1)	Low	2.31 (1.74)	($t(44.31)=-3.39$, $p<.001$, $r=.45$)
	high	4.35 (2.53)	
Overall Mental Workload Score (Task 1)	Low	4.57 (.81)	($t(50)=-5.22$, $p<.001$, $r=.59$)
	high	5.88 (1.00)	
The mental demand of the task (Task 2)	Low	7.31(1.36)	($t(50)=-3.22$, $p<.01$, $r=.41$)
	high	8.35 (1.06)	
The frustration you experienced during the task (Task 2)	Low	1.96 (1.56)	($t(41.59)=-2.17$, $p<.05$, $r=.32$)
	high	3.23 (2.54)	
Overall Mental Workload Score (Task 2)	Low	4.35 (.85)	($t(50)=-5.36$, $p<.001$, $r=.60$)
	high	5.66 (.91)	
BFI Extraversion scale score	Low	3.65 (.74)	($t(50)=2.05$, $p<.05$, $r=.28$)
	high	3.29 (.51)	
Task related interference task 2	Low	18.38 (5.80)	($t(50)=-2.42$, $p<.05$, $r=.32$)
	high	22.46 (6.35)	

Information processing model



(Wickens, et al., 2004, pp.122)

A quick experiment:

http://www.youtube.com/watch?v=Ahg6qcgoay4

Conclusions & Implications

- Reports of feeling under time pressure especially for less experienced pharmacists should be taken seriously by pharmacy managers and the profession as they present a demonstrated and direct link to the occurrence of dispensing errors
- Some dispensary layouts may exacerbate perceptions of time pressure – these should be evaluated
- Where the work being carried out has a safety element the work environment needs to be flexible enough to support these individual differences.

"As compared to other safety critical fields, healthcare does not extensively regulate its own production demands or set limits on its maximum performance. It seems as if there is always the next patient and more after that."

Dekker (2011: pp.6)

Thank you for listening!

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- Mr Chris Coy
- Dr Lynette James
- Dr Philip Rogers

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Download these slides at:
http://errorgirl.com

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